Engelmann (G. J.)

OVARIOTOMY:

DIFFICULTIES DIAGNOSTIC AND OPERATIVE;

CONTINUED MENSTRUATION AFTER DOUBLE OVARIOTOMY.

BY

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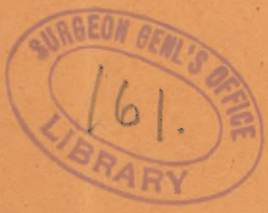

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PROF. OF OBSTETRICS IN THE POST-GRADUATE SCHOOL OF THE MISSOURI MEDICAL COLLEGE; FELLOW OF THE AMERICAN GYNÆCOLOGICAL SOCIETY; OF THE LONDON OBSTETRIC SOCIETY; CONSULTING SURGEON TO THE ST. LOUIS FEMALE HOSPITAL AND ST. ANNE'S LYING-IN ASYLUM, ETC.

At the recent meeting of the American Gynæcological Society in New York, in September, 1881, Dr. T. G. Thomas read a paper entitled, "Extensive Adhesions of the Bladder as a Complication of Ovariotomy;" in this valuable and instructive paper, Dr. Thomas relates some four or five cases in which he had encountered this unforeseen and trying condition, all of which resulted fatally. Fortunately this complication is not of frequent occurrence, and but few of the many experienced operators present expressed themselves as having encountered such extensive adhesions as those found by Dr. Thomas, by which the bladder was drawn up toward the umbilicus, and spread out over the anterior surface of the tumour; literature, he says, furnishes us with but seven cases of this character, in all of which a fatal issue has resulted in consequence of the adhesions, either directly from the injury done the bladder, or indirectly from failure to remove the tumour on account of their existence. The danger arising from such a condition of affairs is readily apparent, especially, if so experienced a diagnostician as Dr. Thomas tells us that it is rarely possible to detect these adhesions beforehand, and thus guard against that almost inevitable accident, the opening of the bladder; by reference to his paper it will be seen how ingeniously he has, in one or two cases, remedied the injury when done. In the discussion following it was my good fortune to be enabled to relate the successful termination of an ovariotomy thus complicated, one of the few cases of the kind on record.

My attention having been once directed to the very serious results threatened by these extensive adhesions of the bladder, in the operation of ovariotomy, I determined at some opportune time to relate this case more fully; in doing so I will also call attention to difficulties in the diagnosis of

certain conditions which it is of the utmost importance to determine before engaging in an ovariotomy; conditions which unfortunately it is often impossible to overcome, notwithstanding the very clear and definite rules laid down in text-books.

I will give in detail two cases in which I have encountered these difficulties in diagnosis, and, although it appears to me that it will be almost impossible to avoid these errors, they will at least serve to caution the operator to guard against them, and not to rely too firmly upon the rules in his text-book. The difficulties I refer to are:—

1. Of determining the existence of adhesions, however firm, to yielding parts.

2. Of differentiating between tumours.

(a) Uterine and ovarian.

(b) Fibro-cystic and colloid.

3. Of detecting the elongation and attachment of the bladder.

The same cases will also serve to illustrate certain features which have appeared to me as of importance in the operation, and which I would emphasize, either because they are usually neglected as too insignificant, or because my practice differs therein from that usually followed. I merely propose to give a few practical hints, and by no means to map out a guide for the operator. I would urge—

1. A regard for the safety of the enlarged bladder.

2. The importance of securing deep and firm union of the abdominal incision, in order to avoid hernia in the convalescent.

3. The importance of the free use of the ligature, and of relying upon fine braided silk cut short.

4. Care in the use of carbolic acid.

5. The early operation, if an operation is at all indicated.

The two following cases will, I believe, best answer our purpose.

Case I. *Colloid Tumour of the Right Ovary; Cystic Degeneration of the Left; Peritoneal Cysts; Extensive Adhesion of the Elongated Bladder; Double Ovariotomy; Continued Menstruation.*—Mrs. T., from Kansas City, consulted me in April, 1880, on account of failing health due to an abdominal enlargement, of less than a year's growth. The patient was 32 years of age, the mother of five children, the youngest being two and a half years old. She first menstruated in her thirteenth year, and was regular ever after, suffering no pain: her labours were easy, and recovery rapid and complete; in short, she always enjoyed excellent health, and at no time complained of backache or any abdominal pain. In the spring of 1879, one year before I was called in, she first complained of a certain lassitude, not of any particular pain, but felt weak and miserable. This slowly passed away, and in the fall she again felt perfectly well.

In September, she noticed for the first time, a certain abdominal enlargement; but being in good health, she thought herself two or three months pregnant, although her menses were still regular and even more profuse than formerly, the flow being very free and continuing for seven days instead of four as usual. She continued well, although the tumour

grew rapidly until December, when she noticed a certain emaciation and a disagreeable backache; experiencing at the same time a feeling of distension in the upper part of the abdomen; but about Christmas time the swelling or tumour seemed to descend, and this distension was relieved, whilst the abdomen seemed to feel more full in its lower portion. The growth of the tumour had apparently ceased, and there was no noticeable increase since December. The patient felt comparatively well, had lost some flesh, was a little weakened, and her appetite was somewhat impaired; still, upon my first examination, she appeared to me in very fair health.

I found the abdomen distended by a smooth, semi-solid, or, if I may use the expression, soft-solid growth of, apparently, like density throughout, resembling in feel a rapidly growing fibroid; it was freely movable, and I accordingly considered it non-adherent, more especially as there was no history of peritoneal inflammation, or even peritoneal tenderness. The tumour was remarkably movable, gliding from side to side as the patient turned in bed, and being readily rolled by the hand over the projecting spine; the uterus also was movable independent of the tumour, and between both there appeared to be no connection. The upper border of the tumour was four and one-half inches above the umbilicus, and extended six or seven inches on either side. A friend, who saw the case in consultation with me a few days later, discovered a slight but distinct fluctuation about and below the navel, which I had not observed in my previous examination, as it either did not exist at the time, or had been overlooked by me; and he was accordingly disposed to consider it a fibro-cystic tumour, probably of the ovary. I looked upon the case as one favourable for operation on account of the good health of the patient and the absence of adhesions as indicated by the mobility of the tumour. She however hesitated until the rapid growth of the neoplasm, evident even to herself and friends, induced her to consent to surgical interference. The increase in size was very marked in the last ten days before the operation. She was carefully prepared, the bowels were freely moved, the urinary and cutaneous secretions stimulated, warm baths were taken daily, digestible and nourishing food—meat and milk—advised, tonics given, and large doses of quinine immediately before the operation.

Thursday, April 22, 1880, I operated, in the presence and with the assistance of Drs. Prewitt, Schenck, Engelmann Senior, Nelson, and Fischel. The urine was removed as usual, but neither was the quantity very large nor did the catheter pass beyond the ordinary depth. The room, which had been deprived of carpets, thoroughly cleaned and ventilated for the past few days, was kept at a temperature of 76° and over, and the atmosphere thoroughly saturated with moisture. Flat vessels with hot water, carbolized, were placed upon the stove and distributed about the room, and two sprays were used; one had been directed upon the couch and bedding for some time before; during the operation itself, the sprays were not directed upon the abdomen of the patient, into the open wound, but from a distance, upon the operators, more for the purpose of saturating the atmosphere with the carbolized moisture than for the purpose of operating directly under the spray, so benumbing to the hands of the operator, and, as I firmly believe, injurious to the exposed peritoneum, and dangerous to the rapidly absorbing surfaces of the numerous and freely exposed raw surfaces.

Hardly had the abdominal incision been made when our troubles began.

I felt sure that I had cut through the peritoneum in the upper part of the incision, which extended as usual from the umbilicus to within three-quartres of an inch of the symphysis (I dislike to cramp myself by a small opening, and believe the danger from injury to the parts in manipulating through an unnecessarily small opening to greatly exceed that arising from a few inches more of incised tissue); but instead of cyst-wall or intestinal coils, I saw a thick, soft, purplish tissue, continuous with the abdominal wall. What was it? it appeared like the thickened wall of, perhaps, a suppurating ovarian cyst, but I thought that I had penetrated the peritoneal cavity, and this tissue was apparently a part and constituent of the abdominal wall. In the dilemma I endeavored to feel the way with my finger towards the upper angle of the incision, and separated this thickened tissue a trifle from the abdominal wall, whereupon a number of delicate whitish cysts, of the size of a hickory-nut, attached to long, slender, thread-like pedicles, slipped out from the opening as a second surprise. As small cysts are not likely to appear in the peritoneal cavity, we supposed them to be either intestinal coils or small cysts coming from the interior of a large one, and that we must have cut through a cyst wall in the first incision. Dr. Prewitt replaced them several times, and still they reappeared; then he pulled them out; the more he pulled the longer they became, and as the experiment appeared a dangerous one, they were tucked back. Later in the operation they again appeared, when I tied several of the thread-like pedicles and cut them off. As soon as I was enabled to insert my finger well into the opening, I felt beneath the smooth surface of the tumour and over it, this thick soft purplish tissue which had puzzled us, apparently the omentum, adherent partially to the tumour, partially to the anterior abdominal wall; I now, with my finger, began to separate the adhesions, as far as possible, from above downwards and toward the right, where, of course, I had most space, the omentum being far to the left. As I progressed the true state of affairs became evident: the omentum was thickened, perhaps to the extent of one-third of an inch, and was adherent in part to the anterior abdominal wall, to the bladder, and by one firm broad band, some three inches in breadth, to the tumour; the attachment to the bladder had become so firm, and so intimate, the thickened omentum and the elongated, distended, and thinned bladder appeared so much alike, that it was only by introduction of the catheter that we could detect the fundus of the bladder, almost at the umbilicus. Two silk ligatures, not carbolized, were placed about the lower portion of the omentum, just above the upper border of the bladder, as indicated by the sound, and then this mass of heavy tissue divided by the scissors; so also was the long, but very broad and thick, portion of omentum attached to the tumour tied and cut. Braided silk of medium thickness was used, and before we were enabled to free the tumour completely, many more ligatures of the finest braided silk were applied. Numerous delicate adhesions, thin long bands, which appeared at every point, were severed. The tumour was now exposed, and proved to be a smooth, round, colloid mass, which I could not but liken to an orange watermelon, after the rind has been removed, on account of its peculiar sections and the absence of any cyst wall or decided outer covering; it was a uniform, colloid, thickly gelatinous mass, simply a little more consistent toward its circumference, but not inclosed in any distinct capsule. It was too large to be removed through the opening, too soft to be cut to pieces, so that I was obliged, after the patient had been turned upon her side and

the tumour dragged into the incision, to claw out this glutinous, colloid mass, by the handful; when it was sufficiently reduced in size to be dragged out, the long pedicle was tied and dropped.

Upon examination the left ovary also was found to be diseased, containing a cyst the size of an orange; this was tied and removed. Six or eight of the delicate little cysts, which at first so annoyed us, still remained; I followed their pedicles to the upper surface of the liver, in the vicinity of the diaphragm, and there tied them. The liver itself was normal and healthy, with a perfectly smooth, transparent, peritoneal surface, and the cysts were in no way connected with the organ itself, but evidently originated from the peritoneum in the neighbourhood of the line of attachment of the liver and diaphragm.

A great deal of time was consumed in thoroughly cleansing the abdominal cavity, as there had been some little oozing, and, moreover, some of the glutinous contents of the tumour had escaped, and were hard to remove; so many larger adhesions had been severed, as well as innumerable smaller ones, that it was some time before I had any certainty that all the vessels had been secured, and the bleeding completely stopped. Most patiently and thoroughly was the abdominal cavity cleansed with warm, soft sponges, well wrung out in pure, hot water, not disinfected; the deep chasm behind the uterus and the surface of the distended and adherent bladder were special objects of our care. Four ligatures of heavy silk, and twenty or more smaller ones were left in place, and the incision closed with heavy silver wire clamped by shot; the ligature, which had been placed above the fundus of the bladder, was fastened within the incision; the others cut short and dropped. I applied my usual dressing, varying from the routine of Lister by the use of carbolized cotton in place of the gauze. We were all grateful when the patient was placed in her bed still breathing and with a fair pulse.

The patient suffered no pain at any time after the operation, with the exception of the first afternoon, when she awoke after a long and healthy sleep from the effects of the anæsthetic; this pain was readily relieved by a small injection of morphine, and, during the rapid convalescence which ensued, the only discomfort experienced arose from the stitches, which I had left in place longer than necessary, being fearful of removing them too soon on account of the severity of the operation, notwithstanding that union by first intention ensued.

During the first day after the operation she was nauseated, and could retain nothing but champagne. But that evening she began to take iced milk, which remained her most important article of diet throughout. Pulse on the second day, eighty-four; on the third, eighty-six, morning and evening, with a temperature of one hundred and one; this was the highest temperature. Upon the fourth day the pulse was eighty-two, temperature ninety-nine and five-tenths, and the morphia, which she did not tolerate very well, was then stopped and not again resorted to. The symptoms were favourable, and the patient steadily improved, sleeping well, relishing her milk and beef-tea. No more narcotics. On the ninth day (not my usual practice, but here indicated) the bowels were moved by an injection of soap and water, and the dressing changed for the second time, and from now on the wound was dressed in cotton steeped in carbolized oil, and covered with oiled silk. The bowels moved naturally on the eleventh day, and not until the sixteenth day did I remove the stitches which had cut and annoyed her considerably for the last few days. I was careful to have

the abdominal wall secured by strips of adhesive plaster, and, as long as she was still in bed, by a well-fitting bandage of home make. As soon as the patient was able to sit up and move about the room, the abdomen was supported by a firm well-fitting bandage, made for her by Mr. Schleifarth. I look upon this as a most important matter, and call especial attention to it, as I have seen some unfortunate results from neglect of proper prevention at this period.

When patient returned home, I insisted upon the greatest care, the wearing of the bandage, abstinence from exertion of any kind, attention to diet, fresh air, and suitable exercise. Although in the main she attended to her household duties throughout the fall, it was not until the following spring that she fully resumed them, and the consequence is that she now enjoys the most perfect good health, is strong and hearty, with a rosy, healthy complexion, dispenses with her bandage, and is able to endure any exertion whatsoever.

Notwithstanding the removal of both ovaries, menstruation continues regular; patient menstruated April 15th, on the 22d I operated; the next menstruation appeared May 18th, quite profuse for four or five days. This was on Monday, five weeks after the last normal menstruation; then three weeks later she again became unwell, Thursday, June 10th; this was resuming the early habit, coming back to the regular time she was accustomed to before the operation. She experienced very little backache, there was no pain, and the flow was free. The next was July 10th to 14th; then a slight flow from July 30th to August 1st, and again August 10th to the 11th. After the operation the flow became more scanty, but there was no pain, and very slight backache. I now supposed that the discharge would grow more scanty and cease, but, on the contrary, after the slight irregularity, menstruation again became normal and regular, and so continues up to date, November 28, 1881.

Mrs. T. is in the full enjoyment of a happy home and family life, full of love and devotion to her husband, children, and friends; a charming lady, in full possession of all womanly attributes, performing every womanly function, wanting only the power of conception, ovulation in this case not accompanying menstruation. I cite this with special reference to those authors who maintain that after the removal of the ovaries women lose their special attributes; the voice becomes harsh, the figure angular, love ceases, etc. Though this be not so, it is true that in the majority of cases menstruation ceases. Peaslee, in his work on "Ovarian Tumours," says that menstruation, or what he calls metrostaxis, continued in only six of all the cases of double ovariotomy known in literature. The function in this instance is so regular and so perfectly like to that experienced before the operation, that I must call it menstruation and not metrostaxis. The specimens in my possession preclude the possibility of a part of an ovary having remained *in situ*, and thus accounting for the continuance of the flow.

Spencer Wells discusses at great length the question of how to deal with the pedicle in double ovariotomy; in times of the clamp it was, indeed, a question; but now I would advise, as I did in this case, to tie

and drop, unless, perhaps, the clamp or cautery were indicated, by special reason, for one or the other of the pedicles.

Case II. *Suppurating Ovarian Fibro-cyst.*—Was called to Belleville in July, 1875, to see Miss Susan X., aged 37, a tall, somewhat angular, slightly anæmic brunette, who had been suffering from uterine hemorrhages. Patient had never complained of backache, bearing down, or abdominal pains, although she sometimes had experienced a feeling of constriction—indistinct constriction of the abdomen. Appetite was moderate, stools regular, inclined to be loose, passages of urine normal; but her early history was rather peculiar, and, I think, indicative of the character of the abdominal enlargement, which she had not noticed until recently, but which the physician in attendance claims to have observed years ago. Menstrual flow first appeared in her thirteenth year, and came in irregular intervals, but always on the same day of the week, Monday, sometimes Sunday; never profuse. At eighteen she took cold whilst washing during the continuance of the menstrual period; profuse flooding followed, and with it the catamenia ceased entirely until her twenty-first year, when she was prostrated with typhoid fever and again had a faint flow for several months. For the next twelve years amenorrhœa existed, until she was thirty-three, when she was again sick for several weeks, and again there was a return of the menstrual flow; it soon ceased, however, not reappearing until three years later, in her thirty-sixth year, in the fall of 1874. In April, 1875, profuse flooding set in, which was almost continuous, sometimes ceasing for a few days, but returning more markedly for three weeks, when, clotted blood escaping, considerable relief followed; she being always relieved when a large clot of blood passed.

External examination showed the abdominal wall relaxed, readily revealing a tumour resembling the gravid womb of the fifth or sixth month. The tumour is somewhat ovoid, larger above, situated about the median line, extending downwards and behind the symphysis. Its surface is apparently smooth, with the exception of a distinct protuberance at its left upper extremity. It reaches almost to the navel, and on either side to within one and a half inch of the anterior superior spine. A vaginal examination showed the labia somewhat congested; the entroitus narrow; vaginal portion small, looking toward the sacrum; in the anterior cul-de-sac, in the position of the anteflexed corpus uteri, is a hard round growth of the size of an apple, which seems to move with the large mass of the tumour, although external pressure produces only a very slight motion. A solid, hard, round, apparently movable mass lies in the hollow of the sacrum, and cannot be separated from the vaginal portion; both appearing equally movable. Sound would not enter beyond the depth of a quarter of an inch.

After repeated dilatations with sponge tents, I was enabled to introduce a sound to the depth of two inches, and to apply iron to the cavity. Advised rest and ergot, Squibb's fluid extract, first one-half teaspoonful twice a day, later one teaspoonful twice a day, tonics, vaginal injections with tannic acid. This was July 18th. Flooding soon ceased. Ergot was borne well. August 12th a slight flow of blood reappeared, scarcely, however, staining the linen. August 20th, found the patient looking better, considerably improved; had gained four pounds, and the tumour had been reduced in all dimensions. Subcutaneous injections of ergotine

were now made, in order to relieve the stomach; and, as has been my experience ever since, I found that the alcoholic solution was much better borne than that in glycerine, as was originally recommended by Hildebrandt, who first advised ergotine injections in uterine fibroids. Hildebrandt's formula was: Ergotin. 3.0 (grammes); glycerin., aquæ, āā 7.5. M. S. One syringeful = 0.2 = 3 gr. ergotin. I used: Ergotin. (Bouj. French aq. extr.), ʒss; alcohol., aquæ, āā ʒj; morph. sulph., gr. 1. M. S. One syringeful = 4 gr. ergot, $\frac{1}{7}$ gr. morph. Injections of this solution were made daily for one week by Dr. Rubach, and caused a sensation of uterine contractions; the patient not feeling well during the time; but the effect was soon visible in a still further decrease of the tumour and in the great improvement of the patient. After the cessation of injections, ergot internally was again resorted to, and continued with one or two day's intermission each week.

Patient continued to improve steadily until October first, when her weight reached 143 pounds, thirteen pounds more than when I first saw her. The tumour now again began to grow both upwards and downwards. I again dilated with a sponge-tent, and was enabled to pass the soft rubber catheter through the tortuous canal to the depth of five inches, although I could not introduce the sound farther than before.

I was in a dilemma as regards the diagnosis: the history of the case pointed to an ovarian disease—the cessation of the menstrual flow, without the appearance of menstrual molimina, the early appearance of the tumour on the right side; on the contrary the recent flooding, the greatly enlarged uterus and its tortuous canal, together with the decided effect of ergot upon the size of the tumour led me to suspect a uterine fibroid, moreover there was a solid tumour in the posterior cul-de-sac apparently immovably connected with the uterus; but especially the decided reduction in size of the tumour by the continued use of ergot caused me to believe that this was a case of uterine fibroids,—submucous, as well as intramural or subserous. The operation by the vagina and uterus was impossible as there certainly were subserous tumours; and the extirpation of the entire uterus appeared to me, at the time, so formidable an operation that I was unwilling to advise it until more urgent symptoms should appear. This was a fatal error, though justified by the rule in vogue at the time, and unfortunately still in vogue among surgeons in this Mississippi Valley, of not operating until life is endangered; actually this was the time to operate; an operation was inevitable, now the patient was in the best of health and spirits, the tumour decreasing in size, digestion good, in short now was the time to operate, now her chances were best. In this one case I have experienced the error, and in many another has the sudden death of the patient from rapid growth of the tumour carried her away, whilst she was waiting for that moment to come when "the tumour should endanger life" which she herself and her attending physician considered the proper time to place her in my hands for operation—before that it would be rash to endanger life by an operation—that terrible and fatal error which still brings death to many a door in this valley. The hemorrhages again made their appearance in January, 1876, fever came, appetite was poor, the patient was even nauseated at times. Stool was thin, intense pain in the right side was experienced, and for a short period in December intense pain accompanied by stitches in the bowels. In January fever increased, difficulty of breathing and loss of appetite were accompanied by a severe pain in the left upper part of the tumour; the cervix

seemed enlarged and hard, and that small tumour in the posterior cul-de-sac was extremely tender to the touch.

Patient was brought to the city in January, and was put under treatment, receiving the most delicate attention and careful nursing from friends who accompanied her. She improved somewhat; pulse and temperature, which throughout January had reached 108 to 140, averaging 120, and 100° F. to 102° F., were somewhat reduced in February, when her pulse remained at 84 to 90, and her temperature about 99.4°. Her condition then appeared at its best, and no farther improvement could be attained, hence the operation was decided upon. The slightest accident, neglect, or imprudence would have caused a relapse and probably a rapidly fatal result in consequence of the incipient pyæmia. The case being a questionable one, she was seen in consultation by several esteemed friends, one of whom gave it as his opinion that the tumour was carcinomatous on account of its recent rapid growth and rough uneven surface and transverse enlargement, for which reason, as well as the immobility of the tumour, he advised against the operation. Another advised me to wait with the operation, as her condition seemed to improve, until the inflammatory stage should have subsided. He correctly diagnosed fluctuation of the left upper portion of the tumour, and an indistinct fluctuation with possibly a thicker fluid—a formation of pus following the inflammatory condition of the tumour in the right upper portion. To me, also, the physical examination revealed the condition last described, fluctuation in the left upper portion with a thicker fluid near the right and solid fibrous masses in the central and lower portions; possibly the inflammatory condition may have been due to the too free use of ergot, as Byford claims that it so occurs. The uterus was very much enlarged, was now immovable, and apparently a mass of solid, hard tumour was wedged in between it and the hollow of the sacrum, so that the condition accordingly appeared to me as that of a suppurating fibro-cyst of the uterus; as the patient's general health did not improve but appeared at its best with a threatening decline and coming pyæmia, I advised the operation.

On February 13, I prepared to operate, with the kind assistance of Drs. Hodgen, Baumgarten, Boisliniere, Schenck, Nelson, Fischel, and others. I was prepared to remove the uterus, clamping the cervix, and was considerably surprised, as the operation advanced, to find that we were dealing only with a fibro-cyst of the ovary. The operation presented no peculiar features, with the exception of the difficulties consequent upon numerous delicate adhesions, partially to the abdominal wall and partially to the intestines, and the difficulty of raising the tumour, on account of the firmness with which the lower fibroid mass was wedged into the hollow of the sacrum, and it was only by strong traction that it came out, and that with a distinct thud. The pulse during the narcosis was at 80, but within an hour after the operation it began to increase in rapidity, and as pulse and temperature slowly rose, the respiration grew more rapid. The patient steadily failed from the moment she fully recovered from the effects of the anæsthetic until she died, thirty-six hours after the operation, notwithstanding the most careful attention and devoted nursing.

The *post-mortem* examination by no means distinctly revealed the cause of death. There was no peritonitis, nor had there been any oozing, no blood was found in the cavity, but some thick yellowish lymph with only slight serous exudation. The abdominal wound had well united, and a thick covering of lymph had been thrown about the pedicle, as well as

several of the larger adhesions which had been tied with ligatures, and also the posterior portion of the bladder.

The operation was performed in the early days of Listerism, and I have often reflected upon the peculiarity of the symptoms, the rapid and steady decline from the moment the patient recovered from the narcosis. The sponges, for days, had been soaked in carbolized water; carbolic acid was freely used in the water in which the sponges were cleansed; the instruments were kept in a five per cent. solution, and the sprays had been directed well upon the wound.

Deductions.—I have endeavoured to relate the histories of the preceding cases as briefly as is consistent with the objects of this paper, and as pointedly as possible, in order to call attention to the difficulties which present themselves, omitting self-evident or well-known points, in order that others may profit by my own accidents or misfortunes, and to show how unreliable many points and rules laid down in text-books may prove when tested in practice, how cautious the operator must be, and how decidedly each case must be judged upon its own merits, how imperfect our suppposedly perfect means of diagnosis have proved, and how helpless they leave us. I will call attention to a few of the difficulties, diagnostic and operative, encountered in these cases, which I believe it will be well for the surgeon to bear in mind.

Hints as to Diagnosis. 1. *The Difficulty of Determining the Existence of Adhesions to Yielding Parts.*—(*a*) In Case I., it will be remembered, the tumour was smooth, round, and freely movable in every direction, rolling from right to left over the promontory of the sacrum. Freely movable up and down, movable independent of the uterus, moving as the patient moved herself from side to side. The abdominal wall was freely movable over the tumor, and no history of abdominal pain or inflammation existed; and yet, upon opening the abdominal cavity a most discouraging condition was revealed: unusually heavy, strong adhesions of the omentum to the tumour, of the bladder to the abdominal wall, and of the bladder to the tumour; but these were all lax, movable organs, attached by long bands of adhesions. The surface of the tumour itself was smooth, hence it was a condition impossible to diagnose.

(*b*) A similar condition of affairs I found existing in a case recently related before the St. Louis Obstetrical Society, in which I attempted *Freund's Operation* for the removal of the cancerous uterus, and was deceived by a similar mobility of the womb. It was freely movable in every direction, and the omentum, bladder, and intestines were attached to it, forming dangerous adhesions, but in no way impeding the mobility of the organ.

(*c*) In Case II., we find a completely immovable mass, a firm, hard portion of the tumour which lay wedged in between the sacrum and the uterus, apparently immovably connected with the latter organ; and yet it was only held in place by mechanical impaction, the pelvis being filled out by the

fibrous portion of the tumour in front of the uterus, the uterus and the tumour in the hollow of the sacrum, and this was so firmly wedged in, that the absolute immobility naturally led us to look for serious adhesions: fortunately none but the slightest, which in no way impeded the operation, were found.

2. *The Difficulty of Differentiating between Abdominal Tumours of Certain Kinds.*—(*a*) In Case I., one of our ablest diagnosticians looked upon this uniform colloid tumour as a fibro-cyst, and although in my first examination of the case, I had diagnosed a tumour of a uniformly semi-solid consistency, I was forced to share his opinion upon a second examination, evidently under other conditions, with a full bladder, and at this time the diagnosis of fibro-cyst was undoubtedly justifiable by the fluctuation—distinct fluctuation—in the region of the navel, extending a short distance downward. This fluctuation, as was shown in the course of the operation, was caused by the urine in an unusually expanded bladder, superimposed upon the colloid tumour, in a most unusual location, without the ordinary appearance of a full bladder, which shows the pear-shaped tumour directly above the symphysis. I believe it almost impossible to have avoided this error.

(*b*) In Case II., I deem my own diagnosis of a uterine fibro-cyst not only justifiable but absolutely necessary on account of the firm connection, by mechanical impaction, of the uterus and the round fibroid mass behind it; the tumour was immovable, the tumour and the uterus were immovably connected; moreover, the uterus was very much elongated and its cavity tortuous, as it would be in a case of intra-mural fibroids. The profuse hemorrhages, the action of ergot in caus ng a cessation of the metrorrhagia, and a reduction in the size of the tumour, all clearly indicated the existence of a uterine growth. The only point indicating an ovarian tumour was the early cessation of the menses without menstrual molimina and the first appearance of the tumour in the right side. But little reliance, however, can be placed upon the last point, as it is simply a matter of record on the part of the patient.

3. *The Difficulty of Recognizing Elongation and Expansion of the Bladder.*—Peculiar as it may appear, this condition is one not readily recognized. Certain it is that the first intimation we usually have of the existence of an elongated and expanded bladder, is given by the entrance of the knife into the cavity. We do not look for it, and hence insert the catheter in a routine manner in withdrawing the urine before the operation. In every single instance should the bladder be carefully explored when this opportunity is given for using the catheter and a long male instrument—rubber,—French or English—should be used; but unfortunately, even a careful exploration may fail to detect this condition, and deplorable results follow with almost infallible certainty.

It is not in every case that we can detect this dangerous condition of affairs.

(*a*) The catheter or sound cannot always be passed to the fundus.

(*b*) There is frequently no disturbance whatsoever in the urinary secretion, either in quantity, quality, or time, and no distress of any kind.

Theoretically it may appear a very simple matter to determine this condition, but when we see how often the experienced operator cuts down into and through the thus distended bladder, this difficulty will become apparent. Dr. Thomas has cut into the bladder, so also Dr. Homans, of Boston, and others. The distension is fan-like; the walls are so thin that the catheter appears distinctly through them; the bladder is partially adherent; the resisting mass of the tumour presses it firmly against the anterior pelvic wall, hence the catheter does not pass, and this adhesion, most difficult of all adhesions to be recognized, is the most important of all to the operator. None other would I dread so much; no other condition so dangerous as a bisected bladder, hence we should scrupulously endeavour to avoid it.

Operative Hints. 1. *A regard for the safety of an enlarged bladder* should make the operator extremely cautious in the completion of the abdominal incision, especially as we have seen that it is often impossible to recognize this condition beforehand, and as the appearance presented by the organ in this state is so deceptive that the most experienced operators have failed to recognize it, and have readily cut into the bladder, usually with fatal result.

In my case, the bladder being drawn up so high by its union with the omentum, and being spread over the tumour and compressed between it and the anterior abdominal wall, was very thin, and of a purplish hue, not to be distinguished from the thickened and inflamed omentum; the subperitoneal areolar tissue is closely adherent on both surfaces, not loosely as is usual, but still partially retains its normal appearance, thus serving to indicate, partially at least, the depth reached; as it forms one layer with the peritoneum we cut through both, believing, as would be the case under ordinary circumstances, that only one layer is severed, and now the peritoneum must come to view; but instead of the thin, pale, whitish-blue membrane, which is looked for, a thick, purplish tissue is seen; what can it be? It is not the smooth, glistening surface of an ovarian tumour; it might be the thickened, inflammatory wall of a pus-cavity, and yet it appears more like a membrane to the touch than a cyst-wall; if the peritoneum has been cut, it has been done accidentally. The operator must not cut into this membrane, which is either a distended bladder, a thickened omentum, or a thickened cyst-wall, but he should carefully endeavour to sever this layer with the scalpel-handle from the superimposed abdominal wall, and to reach its border; if he succeed in this the surface of the tumour or intestinal coils will at once come to view. In order to avoid

the accident as much as possible, I always enter the peritoneum at the upper angle of the incision.

2. *It is a matter of the utmost importance to secure deep and firm union in the line of the abdominal incision*, in order to avoid the occurrence of ventral hernia in the convalescent.

The ordinary precautions should, of course, be observed that the edges of the wound be well adapted, etc.; but I am, moreover, especially careful to use the *heaviest* silver wire obtainable; to include peritoneum and recti, one-half inch of the peritoneum and three-fourths to one inch of integument; to achieve close and firm adaptation of the peritoneal surface, as a perfect union of the external portion can be easily secured by superficial sutures. An unfortunate mistake is often made in endeavouring to obtain a neat adaptation of the parts by the first, deep sutures; and this is usually secured at the expense of the peritoneum and recti; the sutures, in order to allow the surfaces of the cuts to come nicely together, must be drawn tight externally, but remain rather loose in the depth; whilst if they are drawn firmly, as they should be, so that the peritoneal and muscular surfaces are well adapted, the incision usually pouts superficially. As soon as the first wires are removed, straps of adhesive plaster and a home-made, but well-fitting, bandage should be applied to remove any strain from the abdominal walls; the bowels should be kept in good condition, and a strong, well-made bandage or abdominal supporter should be worn for the first month, as soon as the patient begins to move about.

My attention has been called to this point mainly by the large ventral hernia in a patient of mine in a neighbouring city, who was operated on, at my request, during my sickness, by an esteemed colleague, who was, however, unable to personally superintend the after-treatment, and by reason of the absence of a proper support a ventral hernia developed, extending the entire length of the incision; and not until I had secured a proper supporter, with an enormous plate, was the sufferer enabled to attend to her household duties. A second case of the kind occurred in my own practice as the result of an exploratory incision of the abdomen, in a case of attempted removal of the uterus. Patient recovered so rapidly that the proper precautions were neglected; the stitches were removed too soon, she sat up early, and travelled to her home three weeks after the operation; all without the necessary support, so that the recti parted, and the integument alone was left to cover the protruding intestines.

In cases in which the proper precaution was observed, the abdominal walls are as strong as before the operation—I may say stronger—and no exertion is too great for them.

3. *Hemorrhage should be stopped by the ligature, and the finest braided silk which will serve the purpose should be used.*—Torsion, pressure, and cauterization, chemical or actual, are unreliable; harmless upon a surface, but dangerous in a cavity once closed; moreover the tissues are injured

and irritated thereby. I ligate every doubtful point; it is certain, saves time, and is less harmful than any other method. The very finest braided silk will answer almost every purpose, and somewhat heavier threads will answer for the largest vessels; if cut short and dropped, the quantity used is so trifling that it can be entirely disregarded. It is safer than catgut, equally harmless, and much more easily handled. Case I., who carried at least thirty ligatures of silk, four of them very heavy, made an unusually rapid recovery with scarcely any elevation of pulse or temperature. An excellent article can be obtained, but each strand should be tested before using, as time and atmospheric influences often effect serious, yet invisible, changes.

4. *Listerism, as routine treatment, is not only to be avoided, but to be dreaded by the ovariotomist.*[1]—Although Case II. was one most unfavourable for ovariotomy, a suppurating fibro-cyst with pyæmic symptoms, I have never ceased to reproach myself for the use and abuse of carbolic acid during the operation; this was during the early days of Listerism, and I endeavoured to follow the prescribed plan as closely as possible: the sponges, previously steeped in carbolized water, were cleansed during the operation in carbolized water; carbolized water was used for hands and instruments; the spray was directed immediately upon the incision and upon my hands so as to numb them; instruments were kept in carbolized water, ligatures and silk were carbolized. The following collapse and rapid passing away of the patient, already, indeed, pyæmic, has always, in my mind, savoured of carbolic acid poisoning.

[1] Since the reading of this paper, the November number of the *American Practitioner* has come to hand, and with it a paper on Ovariotomy, embodying the latest views of that most successful operator, Thomas Keith, which has afforded me the very greatest pleasure and satisfaction, as his method, finished to the highest degree by successful experience, differs in but few of its details from the course I have adopted in the face of our authorities. Not only have his patients, but also Keith himself has been poisoned by the use of carbolic acid, and since Dec. 1880, he has not used antiseptics, "in the proper sense of the word," as he phrases it, in his ovariotomies, and operates with better success than ever, absolving himself from the sway of that dangerous phantom, that antiseptic mist, which now enshrouds all surgery, and bids fair to rule for some time to come, until its advantages and disadvantages are clearly understood. Many valuable truths are collected in that one short paper, and many facts clearly stated, which writers are accustomed to veil in mystery, or simply to conceal beneath false statements, in order to hide their own ignorance. He properly extols the value of the reflector as an "enormous assistance" in making a careful survey of the abdominal cavity, and as enabling us more readily to see the bleeding point, but seems to think that he alone uses that important instrum nt.

I invariably resort to it before closing the incision as a safeguard, lest some bleeding point should escape me, and I well recall my first ovariotomy upon a dark stormy day, when we should have been absolutely lost without mirror or reflector—and I will add that an ordinary hand-mirror answers that purpose very well, when a reflector does not happen to be at hand.

I myself, in common with other physicians of this city, have been in the habit of using the laryngeal reflector for a variety of other purposes. In the cavities I have found it extremely useful.

I have pursued a different plan since, a modified Listerism, of which Case I. is a fair example, and I am glad to see that Mr. Lister himself has given a death-blow to this carbolic-spray treatment; it will be retained in some few cases, where it indeed serves an excellent purpose, but it must be abandoned as a routine treatment, and, above all, in ovariotomy. Mr. Lister, in commenting upon a case of death from carbolic-spray poisoning, lately reported to the Clinical Society of London, by Mr. Gould, said that "Carbolic acid is too powerful an agent to be safely applied to delicate subjects."

I rely upon absolute cleanliness of patient, operator, and assistants, of room and bedding, sponges, and instruments. My sponges are steeped, for twenty-four or forty-eight hours previous to the operation, in a carbolized, or other disinfectant, solution, and two sprays are directed over bed and operating-table for one-half or one hour previous to the operation; and during the operation itself, from some distance and height, over the operators, but not so as to admit of the carbolic acid being felt in any way. The silk is not carbolized, and the sponges are cleansed in *pure* water—*clear, pure*, but hot water—the sponges must be warm. I also avoid the use of too much carbolic acid in the dressing, and endeavour to protect the integument so as to prevent the possibility of any absorption. I believe that the daily warm bath for a week or more previous to the operation is also an important detail, not only to cleanse the surface, but more particularly to increase the activity of the surface.

Cleanliness is all-important, and carbolic acid, although in a certain measure harmless and even beneficial, is dangerous, as the numerous cases of carbolic-acid poisoning gradually accumulated testify; and dangerous in particular to so delicate and sensitive a membrane as the peritoneum; hence let us be more careful in its use, and, above all, do not attempt to perform ovariotomy strictly under the spray with full antiseptic precautions, in the now accepted sense of the expression.

5, and last, but most important of all, I would advise surgeons in this Mississippi Valley to *operate early*—to give up the *old* and *fatal* rule of *operating only when life is endangered.* Ovariotomy is looked upon as a desperate and almost necessarily fatal resort in this very valley in which McDowell first originated the operation—experience has truly proven it a dangerous operation here—and why? merely because surgeons have acted on the antiquated rule of not operating until life is endangered; then it is too late; the powers are failing; the tumour is encroaching upon vital organs; is infecting the system; the patient no longer has the needed power of resistance; she sees death imminent and *now demands* the operation of the surgeon, and now it is almost necessarily fatal.

The laity look upon ovariotomy as an operation so dangerous that it is to be avoided as long as possible, and in this they are encouraged by the mass of physicians—the few who risk an operation when life is endangered

die as a rule—hence, women prefer to carry their tumours to the grave, to die by reason of their increasing size, and no opportunity is given the patient or the surgeon ; he operates in rare instances, and then under the greatest disadvantages.

If suffering women but understood how greatly their chances were increased by an early operation, and if physicians would urge this upon them, we would have comparatively few fatal cases, and women would hasten to the surgeon as soon as an abdominal enlargement is discovered, and they would look forward to the operation as a means of relief and prolongation of life, and not as a means of hastening death, ovariotomy would at once come to be an operation accepted and acknowledged by the profession and the people ; and the fatal cases would be those—as in all other tumours—in which the patient has waited too long.

I am informed of a number of patients who are now under observation of their physicians in this State and in Illinois, who are waiting for the growth of the tumour, waiting for symptoms threatening life before undergoing the operation—so thoroughly has this rule of not operating until life is endangered been taught that I cannot urge them to seek relief at a reasonable time—did they but realize the precious moments they are losing!

The most important of all the teachings in my experience is to operate early, if you operate at all.

Before closing I will again briefly recall the points I have endeavoured to urge :—

1. Enter the peritoneum at the upper angle of the abdomininal incision, mindful of the safety of an enlarged bladder.

2. Endeavour to secure deep and firm union of the abdominal incision by carefully and closely placed sutures during the operation, and proper support for months after.

3. Ligate all bleeding points, use the finest braided silk, cut short, and drop at once.

4. Avoid routine Listerism, and especially the carbolic acid spray over the hands of the operator and into the abdominal cavity. Cleanliness, not carbolic acid, is necessary. Keep sponges clean and warm, but *not* carbolized ; avoid carbolic acid about the peritoneum and open surfaces. Ligatures, sutures, and instruments should be clean, but not carbolized.

5. Late operations are the scourge of surgeon and patient in this valley. If an operation is indicated, operate early, as the patient's chances decrease with the growth of the tumour and the failing of health.